

Manufacturing Occupational Demand-Supply Analysis for the Central Midwest



Principal Investigator:
David J. Peters

CAREER CONNECTIONS

P-0403-1
April 2003



Additional information is available on-line at:
<http://www.MissouriEconomy.org>

Manufacturing Occupational Demand-Supply Analysis for the Central Midwest

Overview_____2

Data and Methods_____3

Manufacturing

SIC-20 Food Products_____	4
SIC-21 Tobacco Products_____	5
SIC-22 Textile Products_____	6
SIC-23 Apparel & Fabrics Products_____	7
SIC-24 Lumber & Wood Products_____	8
SIC-25 Furniture & Fixtures_____	9
SIC-26 Paper Products_____	10
SIC-27 Printing & Publishing_____	11
SIC-28 Chemical Products_____	12
SIC-29 Petroleum Products_____	13
SIC-30 Rubber & Plastics Products_____	14
SIC-31 Leather Products_____	15
SIC-32 Stone, Clay, Glass & Concrete_____	16
SIC-33 Primary Metals_____	17
SIC-34 Fabricated Metal Products_____	18
SIC-35 Machinery & Computers_____	19
SIC-36 Electrical Products_____	20
SIC-37 Transportation Equipment_____	21
SIC-38 Instruments & Precision Goods_____	22
SIC-39 Miscellaneous_____	23

Summary_____24

Appendix 1 - County Names

Appendix 2 - Occupational Similarity Index Data Tables

Principal Investigator:
David J. Peters

CAREER CONNECTIONS

P-0403-1
April 2003

Overview

The decentralization of the manufacturing sector following World War II created an abundance of jobs across the United States, becoming one of the main economic sectors in the country. However, since the mid-1980s manufacturing has been declining in importance as firms begin to automate production and move operations abroad. Despite these trends, the manufacturing sector still constitutes an important part of local and regional economies in the United States, especially in rural areas. Therefore, it is imperative that policy-makers understand the strengths and weaknesses of their manufacturing base. Given the nature of the global economy, policy-makers need to identify areas of economic comparative advantage that they can build upon; and areas of economic vulnerability that they need to strengthen.

Increasingly, communities are focusing their development efforts at attracting quality jobs, rather than attracting the largest quantity of jobs. Given this preference, the skill and occupational mix of the workforce is a crucial consideration in determining an economic development strategy. A community's chance of successfully attracting a particular industry rests heavily with the occupational base in the community. Labor requirements differ across industries and are based upon the primary economic activity of the firm. In essence, successful economic development partly rests with matching the available occupational base in the community with an industry's occupational demand.

The purpose of this analysis is to provide indicators of the national competitiveness of a region's occupational base in the manufacturing industry in the central Midwest. Occupational similarity can be used by economic developers and policy officials in two ways. First, ranking the similarity scores within a region provides a form of industry targeting that indicates which industries are best suited to the occupational base in the region. Second, industries with high dissimilarity are identified so that programs can be developed which strengthen the labor force in the region in order to make the area more attractive to selected industries.

It is important to note that low occupational similarity does not necessarily mean that the region has poor quality occupations or skill levels. Different types of manufacturing firms require different occupations and skills, and will locate to areas that best suit their labor needs. For example, high technology manufacturing firms may not locate to areas dominated by low-skill occupations since they may have difficulty finding qualified workers. On the other hand, low technology manufacturing firms may not locate to areas dominated by high-skill occupations since they too may have difficulty finding workers willing to work in lower-skill jobs at lower pay.

Data and Methods

One method to measure the disparity between the occupational demand of an industry and the occupational supply in a region is by using the Occupational Similarity Index (OSI). The index produces a similarity measure for a region that is normalized to the national average. Index scores are expressed in standard deviations above and below the national similarity score. The OSI can be interpreted in two ways. First, ranking the OSI values for each industry within a region provides a form of industry targeting that indicates which industries are best suited to the occupational base in the region. Second, OSI values can be used in developing programs that strengthen the labor force in the region in order to make the area more attractive to selected industries.

The OSI is calculated by taking the difference between the industry occupational demand minus the regional occupational supply across 22 occupational groupings, which is then normalized to the national average. National industry occupational demand was derived from Occupational Employment Statistics data from the U.S. Bureau of Labor Statistics. Regional occupational supply was derived from STF-3 Census 2000 data from the U.S. Census Bureau. Data was gathered at the county-level for five central Midwestern states that included Arkansas, Illinois, Iowa, Kansas and Missouri.

OSI values less than 0.0 indicate a greater occupational similarity or match between national industry demand and regional supply. This indicates that the region has the labor needed to support that industry, which may indicate a national competitive advantage in terms of labor compared to the rest of the United States. Conversely, OSI values greater than 0.0 indicate a lower occupational similarity or dissimilarity between national industry demand and regional supply. This indicates that the region does not have the required labor needed to support that industry.

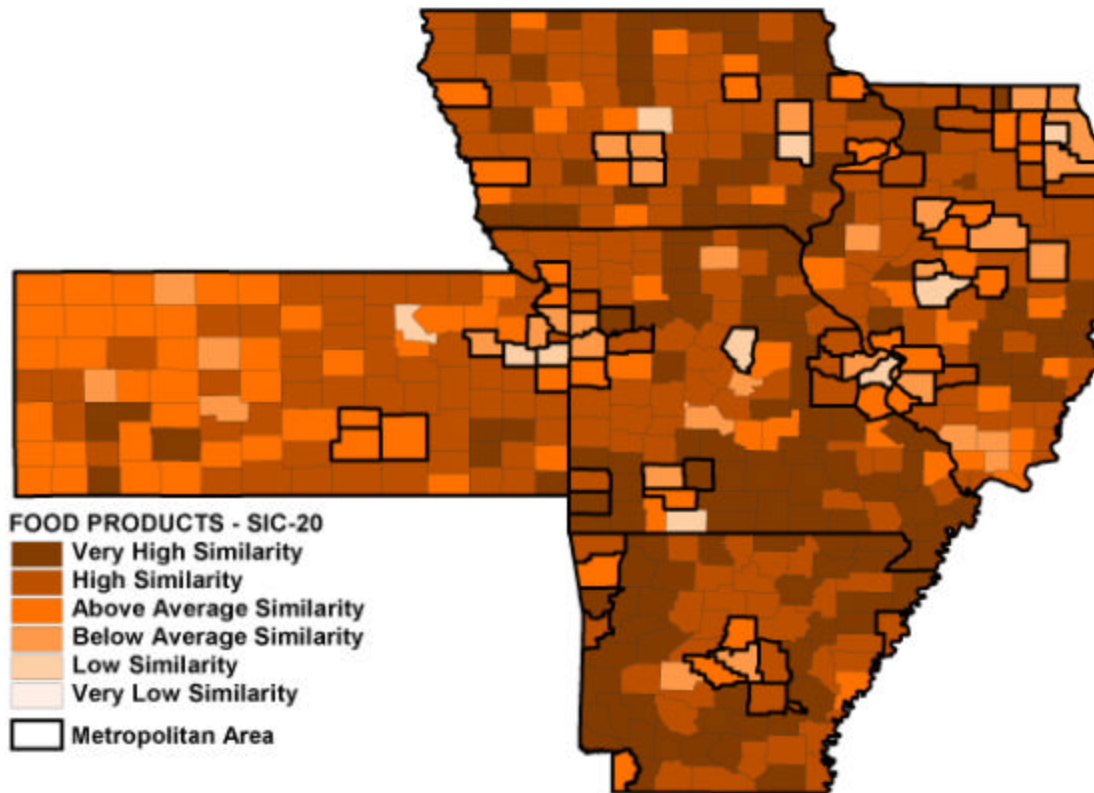
$$OSI_{ir} = \left(\frac{OS_{ir} - \mu_n}{\sigma_n} \right)$$

$$OS_{ir} = \sum_{j=1}^{22} \left| \left(\left(\frac{E_{jr}}{E_r} \right) - \left(\frac{E_{ijn}}{E_{in}} \right) \right) \right|$$

Where:

- μ = Mean of OS Scores
- s = Standard Deviation of OS Scores
- i = Industry
- j = Occupation
- r = Region
- n = Nation
- E = Employment

Food Products Manufacturing



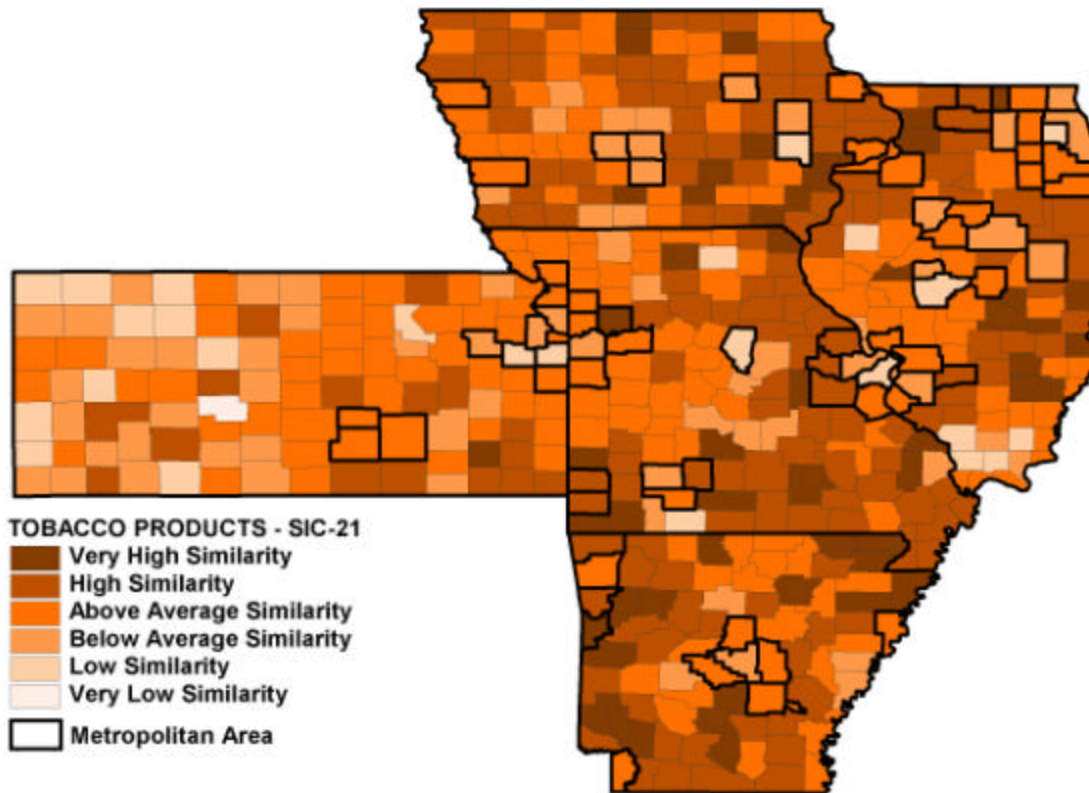
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	51.4%
Transportation & Material Moving Occupations	20.9%
Office & Administrative Support Occupations	8.3%
Installation, Maintenance & Repair Occupations	6.4%
Sales Occupations	3.5%

In Missouri 90 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 43 counties had high similarity and 47 counties had very high similarity. The top similarity counties were:

SHANNON	MC DONALD
CLARK	LACLEDE
BOLLINGER	DOUGLAS
GASCONADE	RIPLEY
SULLIVAN	BARRY

Tobacco Products Manufacturing



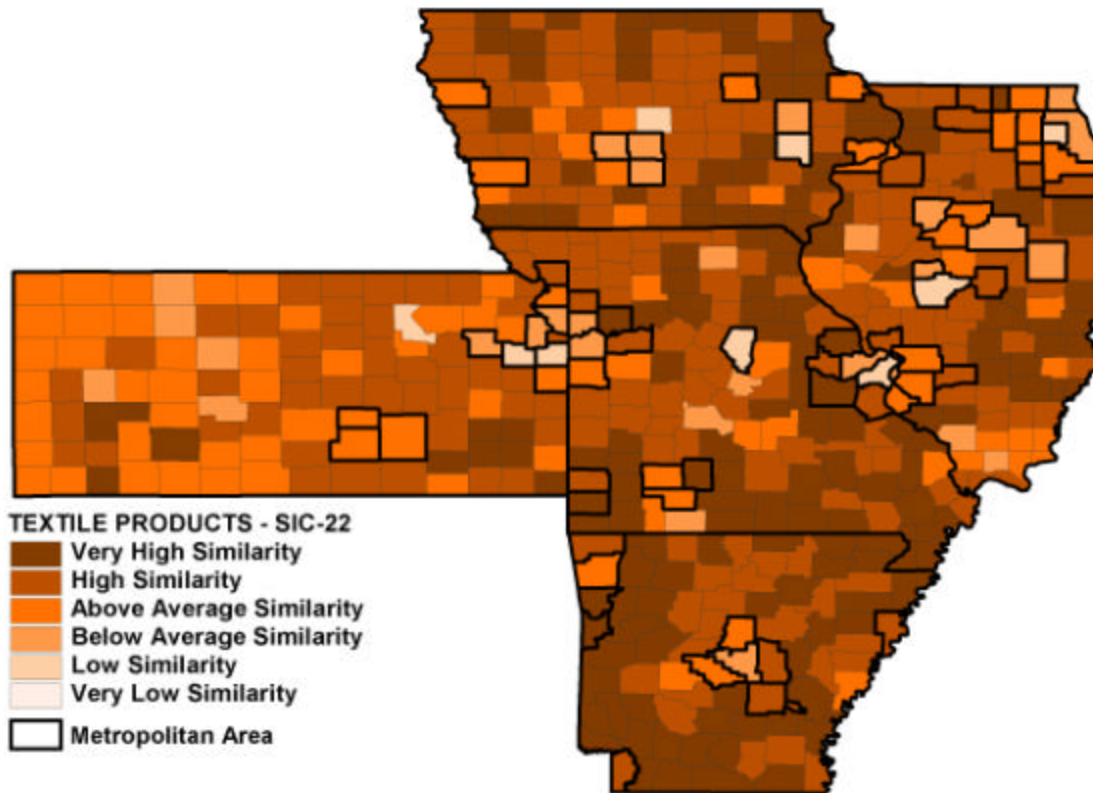
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	36.6%
Transportation & Material Moving Occupations	16.7%
Office & Administrative Support Occupations	12.8%
Installation, Maintenance & Repair Occupations	10.6%
Management Occupations	7.7%

In Missouri 57 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 45 counties had high similarity and 12 counties had very high similarity. The top similarity counties were:

GASCONADE	MC DONALD
BOLLINGER	SULLIVAN
LACLEDE	PERRY
BARRY	DOUGLAS
BARTON	RAY

Textile Products Manufacturing



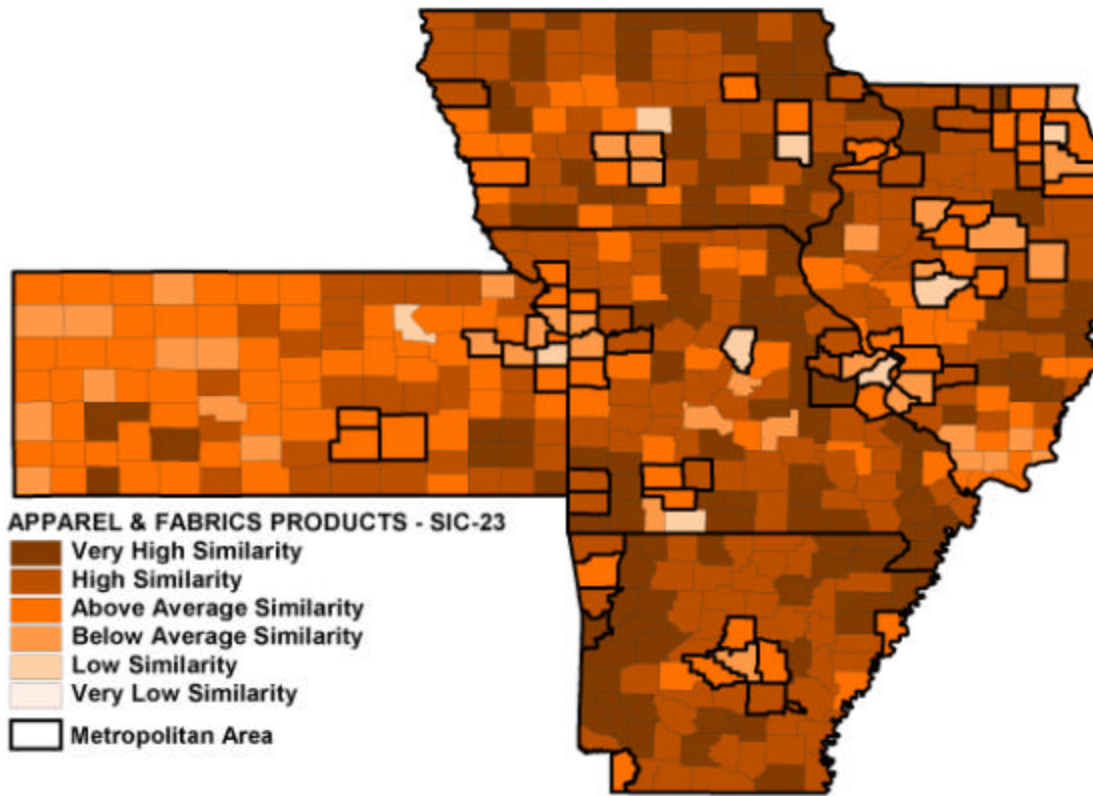
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	64.3%
Transportation & Material Moving Occupations	9.6%
Office & Administrative Support Occupations	8.6%
Installation, Maintenance & Repair Occupations	7.6%
Management Occupations	4.2%

In Missouri 93 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 48 counties had high similarity and 45 counties had very high similarity. The top similarity counties were:

GASCONADE	DOUGLAS
BOLLINGER	CRAWFORD
LACLEDE	RIPLEY
SULLIVAN	BARTON
BARRY	MONROE

Apparel & Fabrics Products Manufacturing



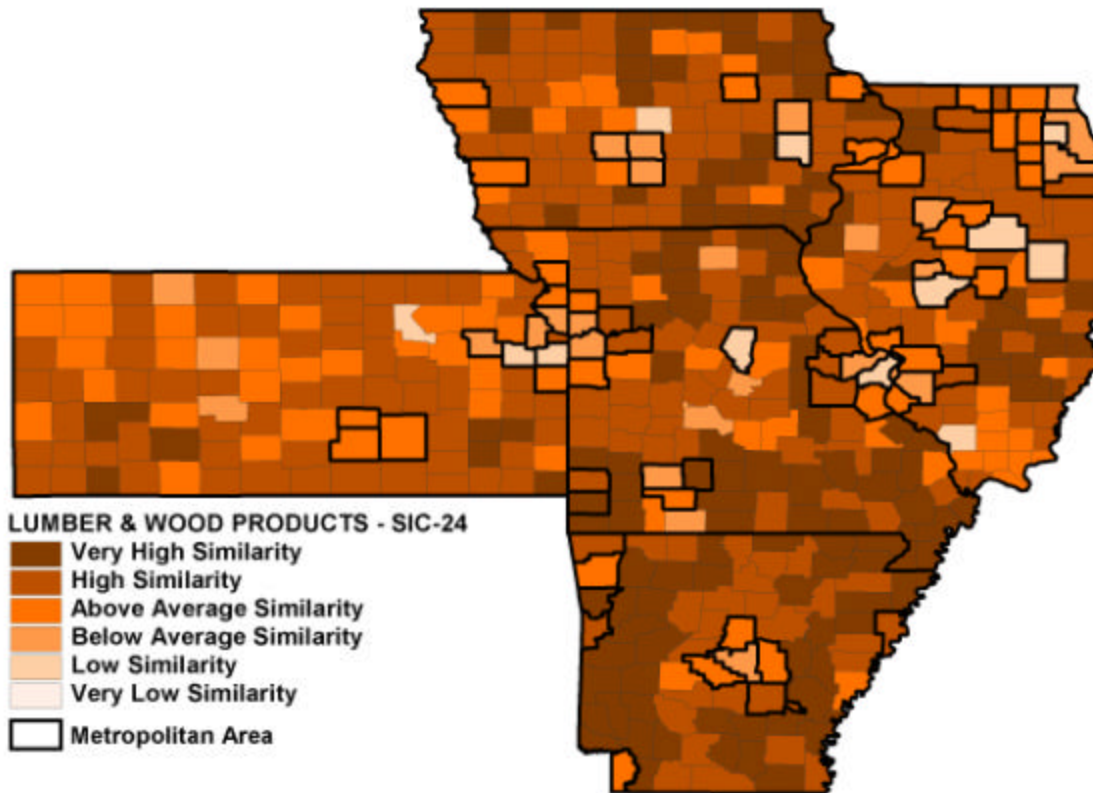
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	68.5%
Office & Administrative Support Occupations	11.6%
Transportation & Material Moving Occupations	7.7%
Management Occupations	3.9%
Sales Occupations	2.3%

In Missouri 84 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 50 counties had high similarity and 34 counties had very high similarity. The top similarity counties were:

GASCONADE	BOLLINGER
LACLEDE	MC DONALD
SULLIVAN	MONROE
BARRY	LINN
DOUGLAS	RIPLEY

Lumber & Wood Products Manufacturing



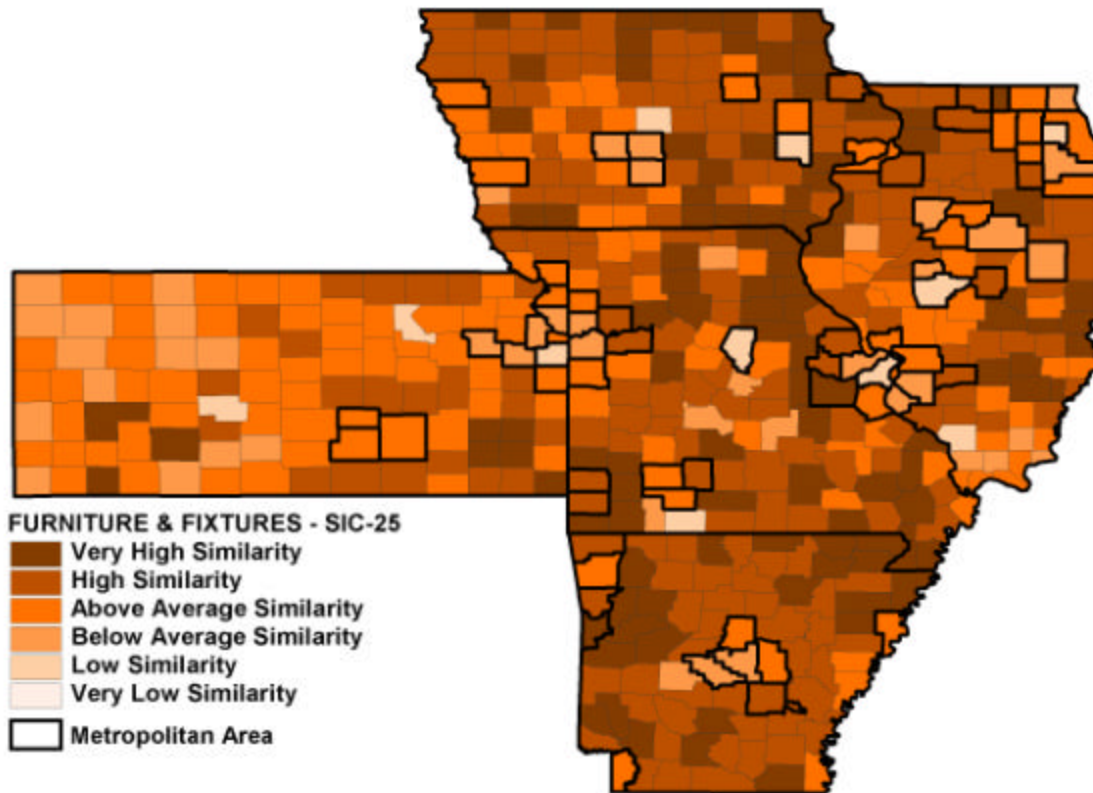
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	47.5%
Transportation & Material Moving Occupations	17.0%
Office & Administrative Support Occupations	7.3%
Farming, Fishing & Forestry Occupations	7.0%
Construction & Extraction Occupations	6.0%

In Missouri 87 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 45 counties had high similarity and 42 counties had very high similarity. The top similarity counties were:

SHANNON	BARRY
SULLIVAN	RIPLEY
DOUGLAS	BOLLINGER
GASCONADE	LACLEDE
MC DONALD	CLARK

Furniture & Fixtures Manufacturing



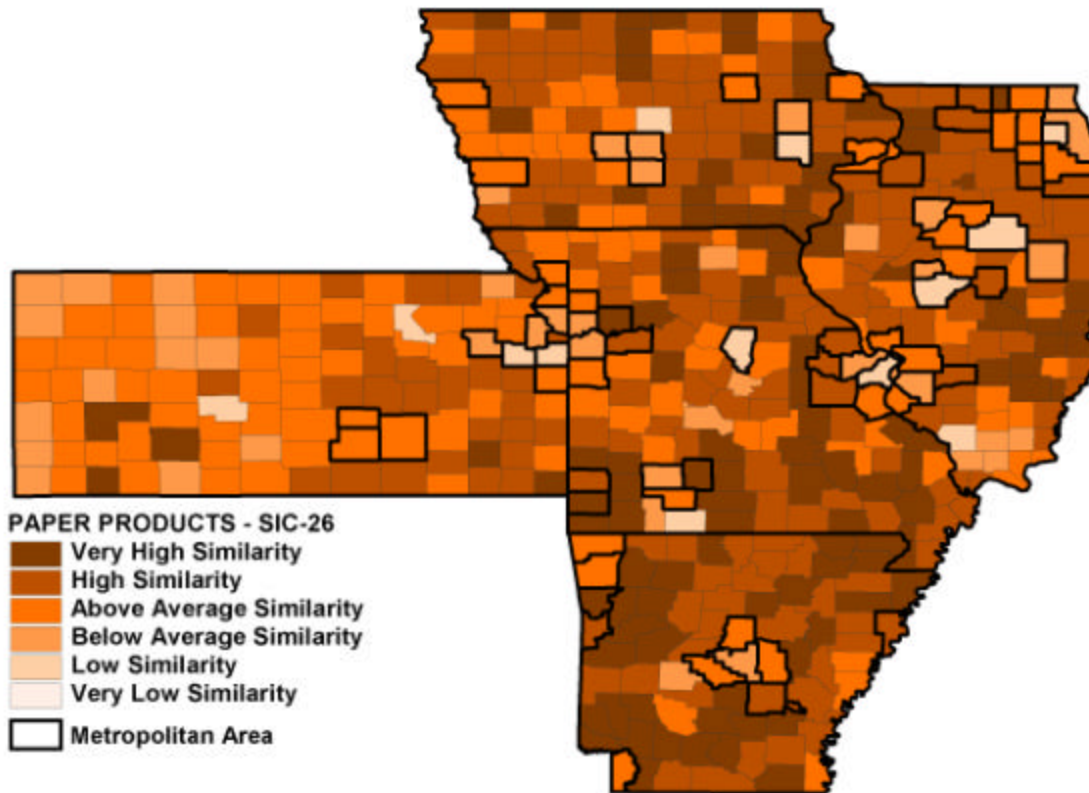
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	67.2%
Office & Administrative Support Occupations	9.3%
Transportation & Material Moving Occupations	8.2%
Management Occupations	4.6%
Sales Occupations	2.2%

In Missouri 77 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 45 counties had high similarity and 32 counties had very high similarity. The top similarity counties were:

GASCONADE	MONROE
SULLIVAN	BOLLINGER
LACLEDE	BARTON
BARRY	RIPLEY
DOUGLAS	LINN

Paper Products Manufacturing



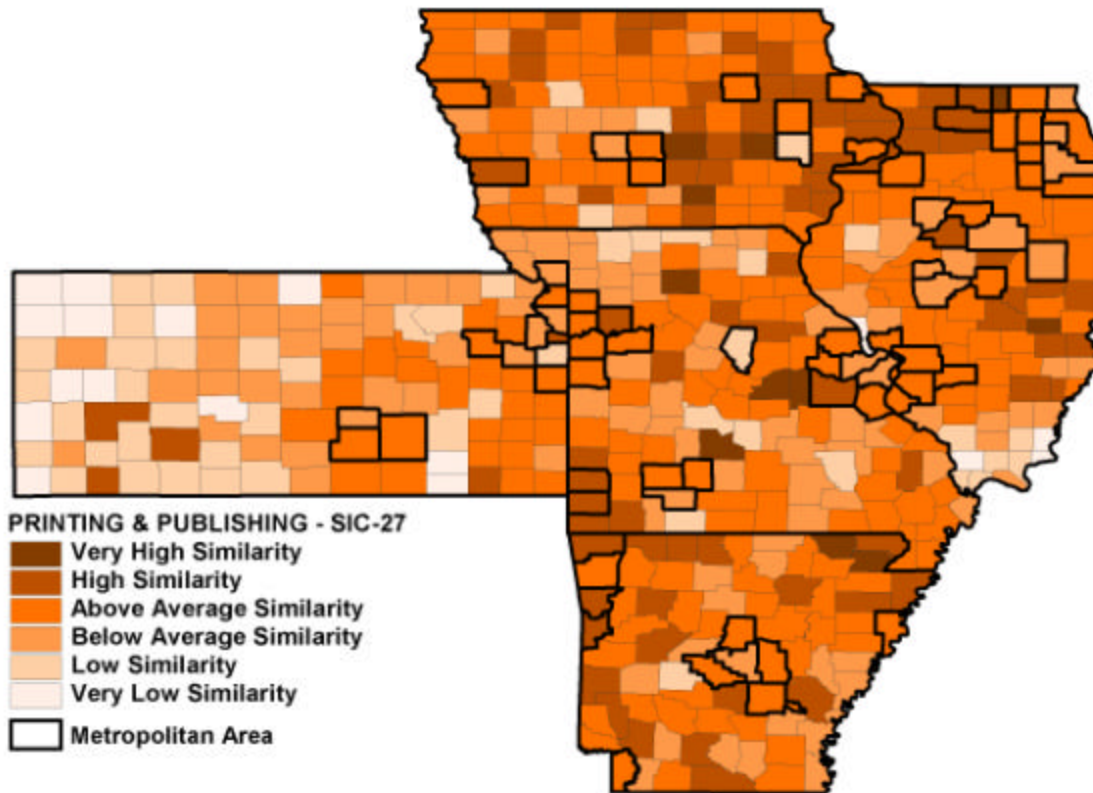
On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	52.7%
Transportation & Material Moving Occupations	14.6%
Office & Administrative Support Occupations	9.5%
Installation, Maintenance & Repair Occupations	7.6%
Management Occupations	4.9%

In Missouri 75 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 41 counties had high similarity and 34 counties had very high similarity. The top similarity counties were:

GASCONADE	CLARK
BOLLINGER	BARRY
LACLEDE	MC DONALD
SHANNON	DOUGLAS
SULLIVAN	BARTON

Printing & Publishing Manufacturing



On average across the United States, the top five occupations demanded in this industry include:

Production Occupations	32.6%
Office & Administrative Support Occupations	22.1%
Arts, Design, Entertainment & Media Occupations	12.5%
Sales Occupations	9.9%
Transportation & Material Moving Occupations	8.9%

In Missouri 16 counties had high or very high similarity between national occupational industry demand and county occupational supply, where 12 counties had high similarity and 4 counties had very high similarity. The top similarity counties were:

OSAGE	AUDRAIN
LACLEDE	BARTON
GASCONADE	PETTIS
LINN	JASPER
BARRY	FRANKLIN